SERVICE MANUAL FOR ALDE ELECTRICAL HEATER

2737
2762
2763

CE

Alde®

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Foreword

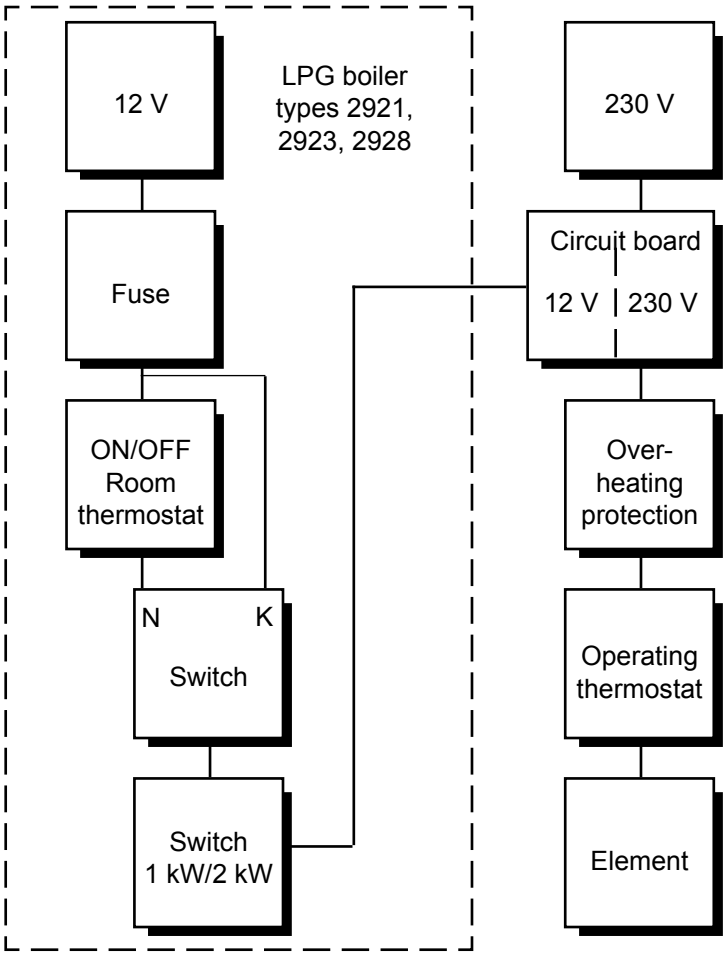
This service manual is intended to assist with servicing and fault-finding in caravans, motor caravans and sheds equipped with Alde's Electrical Heaters, types 2737, 2762 and 2763. The manual may also be of assistance in ordering spare parts, in understanding how the heaters operate, and how they are installed.
We hope that you will find this manual very useful, and that it will save you time during service and faultfinding on our electrical heaters.

Alde International Systems AB
Service Department

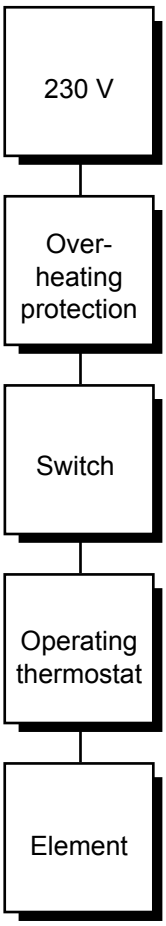
***NOTE**! We reserve the right to make changes after this manual has been printed.*

1:0 Flow chart

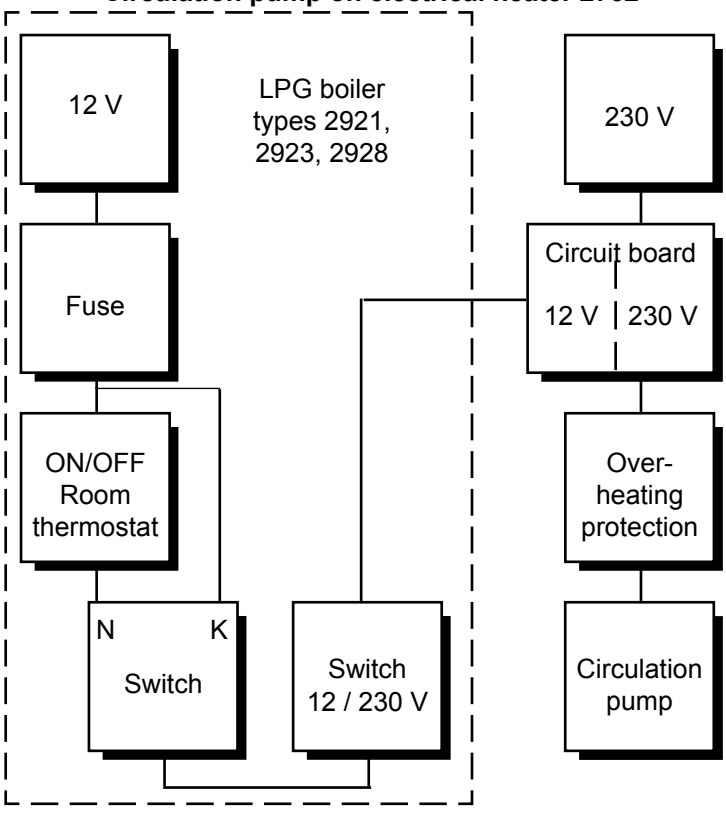
Heat on electrical heaters 2737 and 2762



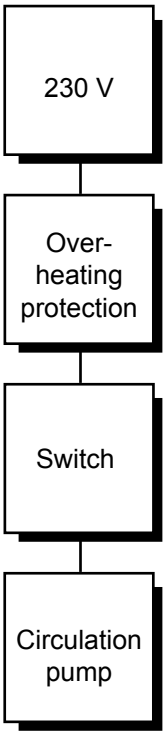
Heat on electrical heater 2763



Circulation pump on electrical heater 2762



Circulation pump on electrical heater 2763



2:0 About the electrical heater

The construction of the electrical heater:
The electrical heater is intended for fitting inside a caravan, motor caravan or similar. It is made from a steel tube with 2 1050-watt stainless elements inside. At one end of the tube a 230 V circulation pump is fitted (not 2737). A bipolar overheating protection (110 °C) and an operating
thermostat (80 °C) which regulate the liquid temperature in the electrical heater are fixed to the connection box on the long side of the tube.

2:1 Technical data

Length:..... 380 mm (315 without motor)
Height: ..... 150 mm
Width: ..... 85 mm
Weight: ..... 3.0 kg (2.2 kg without motor)
Rated voltage: ..... 230 V ~
Element output: ..... 2100 W (1050 + 1050)
Motor power: ..... 25 W
Connection pipe: ..... Ø 22 mm
Liquid volume: ..... 1 litre

3:0 General faultfinding

This guide to general faultfinding should be useful in rapidly establishing where in the electrical heater the fault may lie. This saves time in faultfinding. For more detailed faultfinding, see sections 4:1 – 4:6.

Fault	Possible fault in
Electrical heater	Electrical supply, fuse, does not heat up over heating protection, temperature-settings
Electrical heater not warm	Output selection, operating thermostat
Electrical heater warm but no heat in the caravan	Circulation pump, air inheating system, warm water heater
Electrical heater boiling	Operating thermostat, air in the electrical heater
Noise in circulation	Air in the system, pump 230 V, foreign object in pump housing, pump motor, impeller
Uneven temperature in the caravan	Room thermostat, connections
Too little warm water	System temperatures, circulation pump, water-flow

4:0 Faultfinding on electrical heater

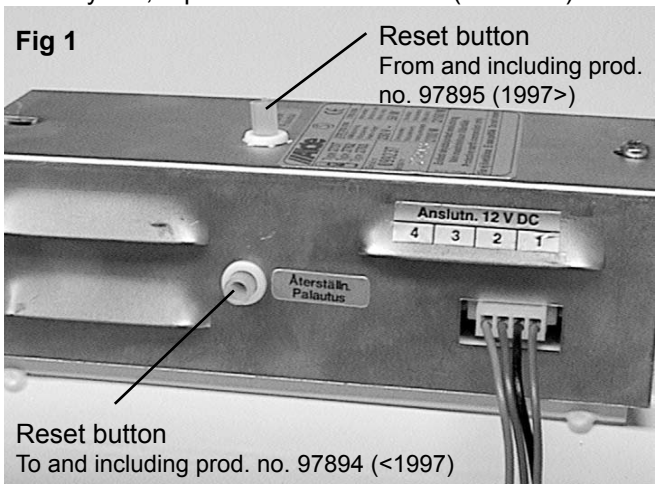
This Chapter contains a more detailed faultfinding chart, where both the cause of the fault and the remedial action which should be carried out are identified. The procedure for replacing the parts is given in Chapter 5.

4:1 The electrical heater does not function

Cause:
- No electrical supply to the electrical heater.
- Overheating protection tripped/faulty.
- Output selection switch not in ”ON” position.
- Fuse on boiler control panel blown (not 2763).
- Circuit breaker on the room thermostat in ”OFF” position (not 2763).
- Temperature setting too low, the room thermostat has tripped (also applies to 2763 if 230-volt room thermostat fitted).
- The relays on the circuit board do not pull (not 2763).

Remedial action:
- Check that there is electrical power (230 V) at the wall socket where the electrical heater is connected.
- Check that the switch for output selection on the control panel or directly on the electrical heater (2763) is set at 1000 or 2000 W.
- Check whether the electrical heater functions when the switch on the boiler control panel is set in the position for warm water. When this is done, the heater should run continuously, as the room thermostat is disconnected. (not 2763).
- Check that the circuit breaker on the room thermostat is in the ”ON” position (not 2763).
- Check that the temperature setting on the room thermostat is higher than the temperature in the caravan (also applies to 2763 if 230-volt room thermostat fitted).
- Check that the fuse in the boiler control panel is intact (not 2763).
- Check whether the overheating protection has been tripped by pushing in the reset button (see figure 1).
- Check that there is electrical current through the overheating protection. If not, replace the overheating protection.
- Check that the relays on the circuit boards are not burnt. If they are, replace the circuit board (not 2763).

Fig 1



4:2 The electrical heater does not heat up

Cause:
- Output selection too low.
- Voltage to electrical heater too low.
- Only one element functioning.
- Operating thermostat triggering too early.

Remedial action:
- Increase the output to max (2000 watt).
- Check that the voltage to the electrical heater is 230 V~. If the voltage at the electrical heater is low, measure it in the electrical supply pillar or the socket from which the current is taken.
- Check that any extension cables are not too long and are of adequate cross-sectional area.
- Use a clip-on ammeter to check the resistance (50 ohm) to check that the elements are undamaged.
- Check that the relays on the circuit board function and the contact surfaces are not burnt (not 2763). If they are, replace them.
- Replace the operating thermostat.

4:3 The electrical heater boils/ Overheating protection trips

Cause:
- Air pocket in the electrical heater.
- The operating thermostat trips too late or is not working.
- If the switch on the control panel is in the warm water position, i.e. the electrical heater is switched off by the internal operating thermostat, it is possible for some boiling noises to be heard just before it trips. Check whether moving the switch to the neutral position causes the boiling noise to disappear (not 2763).
- Overheating protection defective.

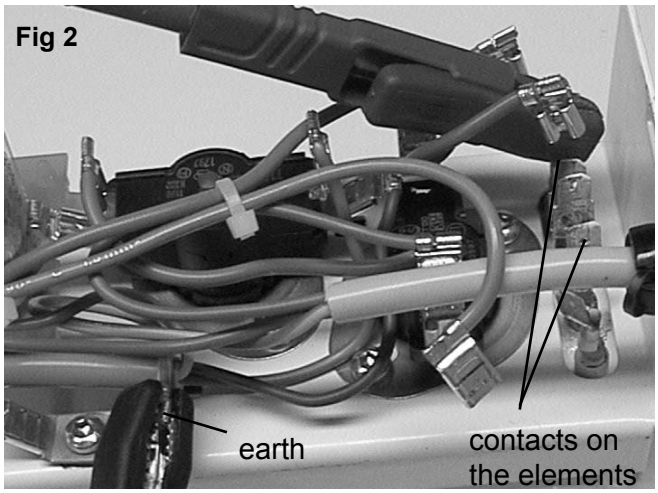
Remedial action:
- Bleed the heating system, see the caravan instruction book. Where the electrical heater has been installed horizontally, it may help to raise the electrical heater a few centimetres at the pump motor so that the air automatically escapes through the outlet pipe.
- Replace the operating thermostat.
- If the overheating protection trips without the electrical heater boiling, the overheating protection must be replaced.

4:4 Fuse/earth fault circuit breaker trips

Cause:
- Short circuit.
- Poor insulation in the electrical heater.
- Poor insulation in the elements.

Remedial action:
- Check that the cables have not been damaged and that the cable lugs are not in contact with each other.
- Check the insulation in the electrical heater with a multi-meter (megger) by measuring the resistance between earth and the phase/zero in the pin plug. It should be > 2 Mohm.
- If the insulation in the electrical heater was poor, check whether the fault is in the elements. Remove the casing (see fig 4), as well as all the cables on the flat-pin terminals (see fig 2) on the elements. Then, using a multi-meter (megger), check the insulation between the flat-pin contacts and earth.
- If the insulation is less than 2 Mohm, the electrical heater tube must be replaced. If the insulation was satisfactory, the fault will be in one of the components in the electrical heater.

Fig 2



4:5 The circulation pump does not start/No circulation of liquid

Cause:
- Switch for circulation pump not switched on.
- Switch on room thermostat not in the ”ON” position (not 2763).
- Temperature too high, the room thermostat has triggered (also applies to 2763 if a 230- volt room thermostat has been fitted).
- The relay for the circulation pump on the circuit board is faulty (not 2763).
- Cable not connected to/in pump motor.
- Pump motor faulty.

Remedial action:
- Check that the selection switch for the circulation pump is in the 230 V position (not 2763).
- Check that the switch on the room thermostat is in the ”ON” position (not 2763).
- Check that the temperature setting on the room thermostat is higher than the temperature in the caravan (also applies to 2763 if a 230-volt room thermostat has been fitted).
- Check that the relay is not burnt. If it is, replace the circuit board (not 2763).
- Remove the cap on the pump motor and check that the cables are properly attached at the connection block.
- Replace pump motor.

4:6 Noise in circulation pump

Cause:
- Impeller in pump housing does not rotate freely.
- Wear in bearing on impeller.
- Wear in shaft on pump motor.

Remedial action:
- Remove the pump motor and impeller, and check that the pump housing is free from foreign objects.
- Remove the pump motor and replace the impeller.
- Replace the complete pump motor.

5:0 Replacing components

This Chapter shows the easiest way of replacing components in an electrical heater.

NOTE! All work on the electrical heater may only be carried out by authorised electrical installation personnel in accordance with the relevant regulations. Always switch 12 V DC and 240 V off before servicing.

5:1 Replacing the circuit board

1. Open the main circuit breaker or remove the pin plug for the electrical heater from its wall socket.

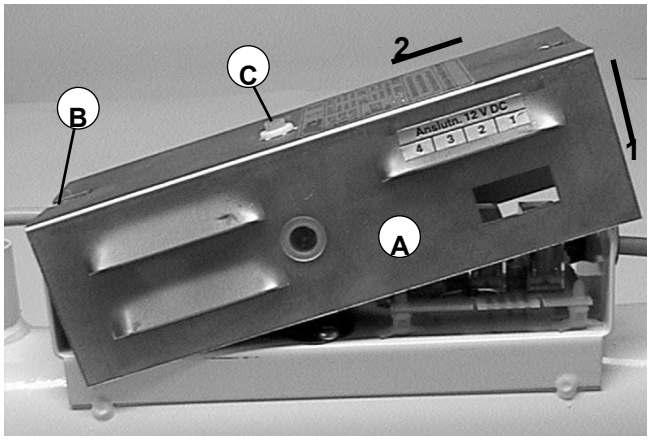
2. Pull out the connection block (fig 3 A) and remove the screw (fig 3 B).

3. Remove the casing (fig 4 A) by lifting up the rear edge, and then pulling it backwards and upwards at an angle.

4. Cut off the cable tiers (fig 5 A) and pull out the cables (fig 5 B and 6 B) from the flat-pin terminals.

Fig 3

Fig 4



5. Push in the gills, one after the other, on the four plastic spacers (fig 7 A) with pliers or similar, to release the circuit board, and then pull it straight upwards.

6. Push the new circuit board firmly into the plastic spacers, and connect the lugs in the flat-pin terminals. Fit new cable tiers around the cables.

7. Replace the casing, first placing the tab in the hole (fig 4 B) and then push the casing down and tighten the screw (fig 3 B). Check that the plastic bush for the overheating protection (fig 4 C) is not jammed (is loosely fitted in the casing).

8. Close the main circuit breaker or push in the pin plug and test-run the electrical heater.

Fig 5

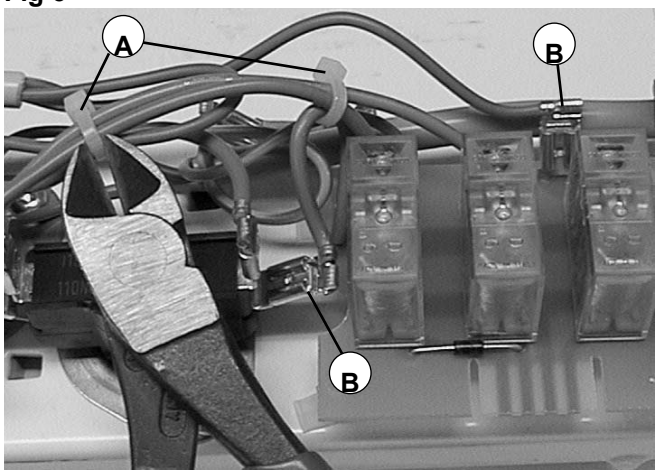


Fig 6

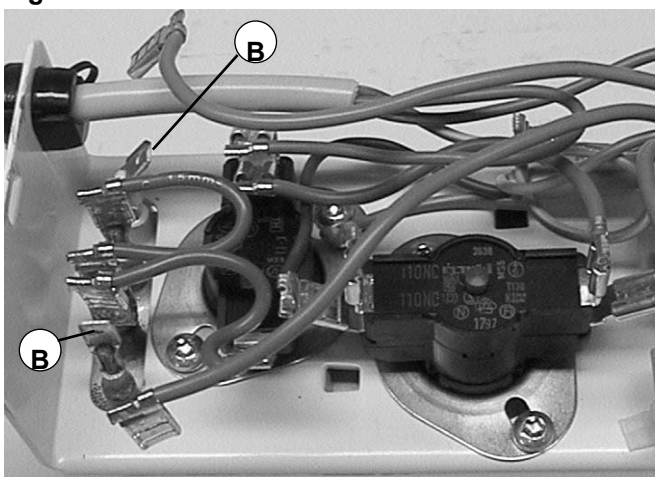
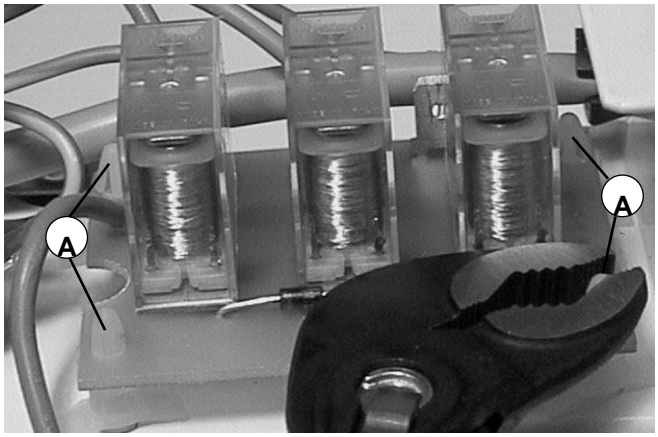


Fig 7



5:2 Replacing the operating thermostat

1. Open the main circuit breaker or remove the pin plug for the electrical heater from its wall socket.

2. Pull out the connection block (fig 3 A) and remove the screw (fig 3 B).

3. Remove the casing (fig 4 A) by lifting up the rear edge, and then pulling it backwards and upwards at an angle.

4. Pull out the cables (fig 8 A) from the flat-pin terminals.

5. Unscrew the screws (fig 8 B) and remove the operating thermostat (fig 8 C). Angle it slightly during removal to prevent the mounting flange catching the overheating protection.

6. Check that there is thermal conduction paste left on the contact surface with the electrical heater (fig 9 A). If there is not, it can be ordered from Alde's Service Department. Fit the new operating thermostat, and replace the screws.

7. Fit the cables in the flat-pin terminals.

8. Replace the casing, first placing the tab in the hole (fig 4 B) and then push the casing down and tighten the screw (fig 3 B). Check that the plastic bush for the overheating protection (fig 4 C) is not jammed (is loosely fitted in the casing).

9. Close the main circuit breaker or push in the pin plug and test-run the electrical heater.

Fig 8

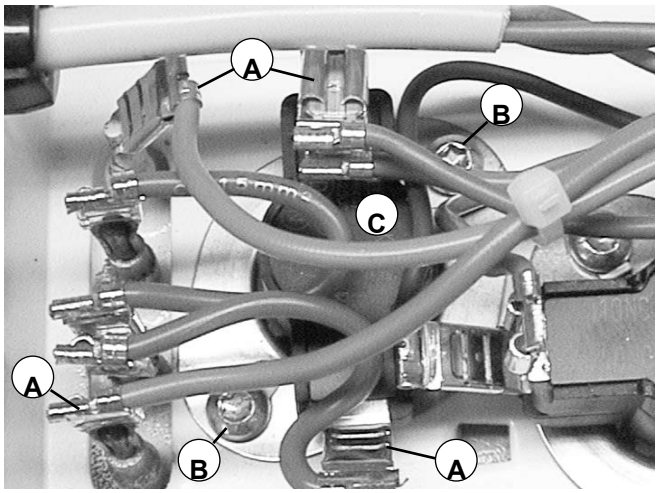
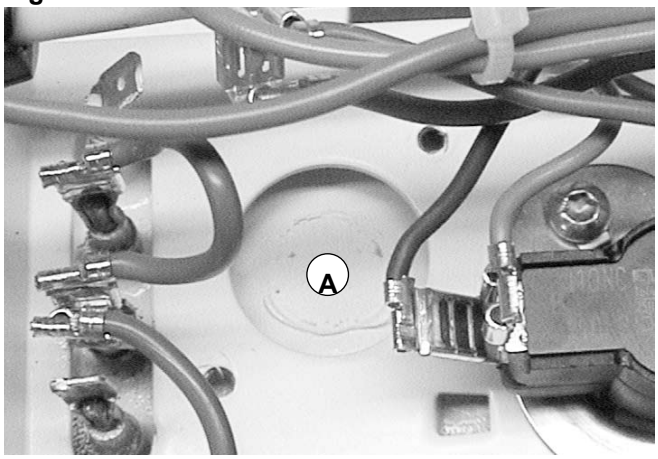


Fig 9



5:3 Replacing the overheating protection

1. Open the main circuit breaker or remove the pin plug for the electrical heater from its wall socket.

2. Pull out the connection block (fig 3 A) and remove the screw (fig 3 B).

3. Remove the casing (fig 4 A) by lifting up the rear edge, and then pulling it backwards and upwards at an angle.

4. Pull out the cables (fig 10 A) from the flat-pin terminals.

5. Slacken the screws (fig 10 B) and remove the overheating protection (fig 10 C).

6. Check that there is thermal conduction paste left on the contact surface with the electrical heater (fig 11 A). If there is not, it can be ordered from Alde's Service Department. Fit the new overheating protection, and replace the screws.

7. Fit the cables in the flat-pin terminals.

8. Replace the casing, first placing the tab in the hole (fig 4 B) and then push the casing down and tighten the screw (fig 3 B). Check that the plastic bush for the overheating protection (fig 4 C) is not jammed (is loosely fitted in the casing).

9. Close the main circuit breaker or push in the pin plug and test-run the electrical heater.

Fig 10

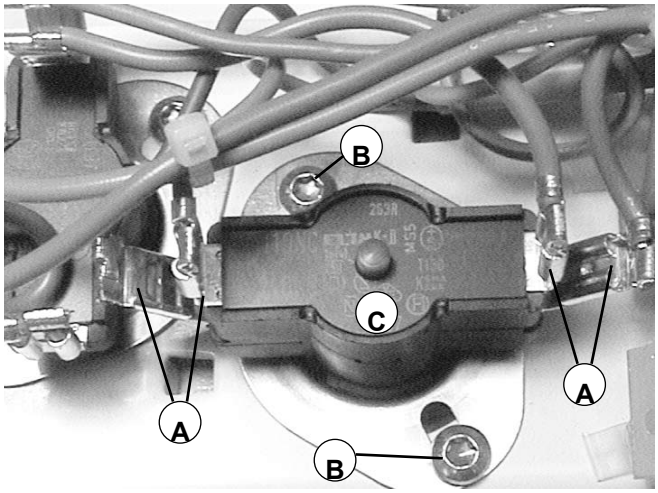
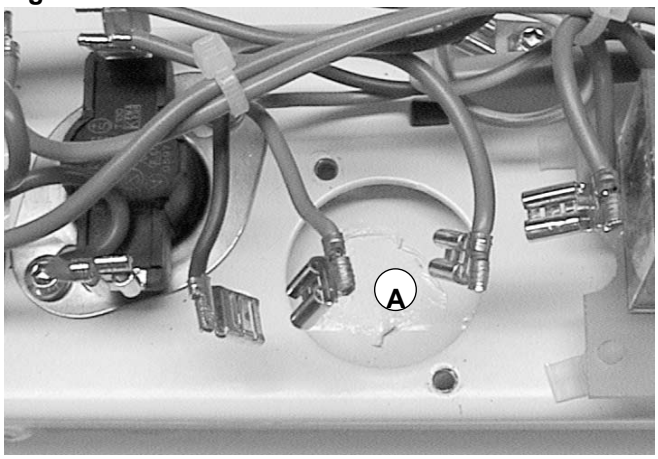


Fig 11



5:4 Replacing the circulation pump

NOTE! When replacing the pump motor on older models which do not have a pump ring, one must be fitted. See section 5:6.

1. Drain the liquid from the heating system (see the caravan or boiler instruction book for the location of the drain cock). Open the main circuit breaker or remove the pin plug for the electrical heater from its wall socket.

2. Unscrew the four screws (fig 12 A) in the retaining plate. Lift off the pump motor (fig 12 B) from the electrical heater, and remove the impeller and the o-ring (fig 14 B).

3. Remove the casing from the pump motor by unscrewing the screws (fig 13 A) on both sides.

4. Release the cables from the connection block on the pump motor (fig 13 B), as well as the earth cable (fig 13 C). Remove the cable de-tensioner (fig 13 D) on the motor, and pull out the cable.

5. Remove the retaining plate (fig 12 C) and move it over to the new pump motor.

6. Then connect the cables (phase and zero as shown in fig 13 B and earth, yellow/green as shown in 13 C) to the new pump motor, and then replace the cable de-tensioner. Fit the casing on the motor.

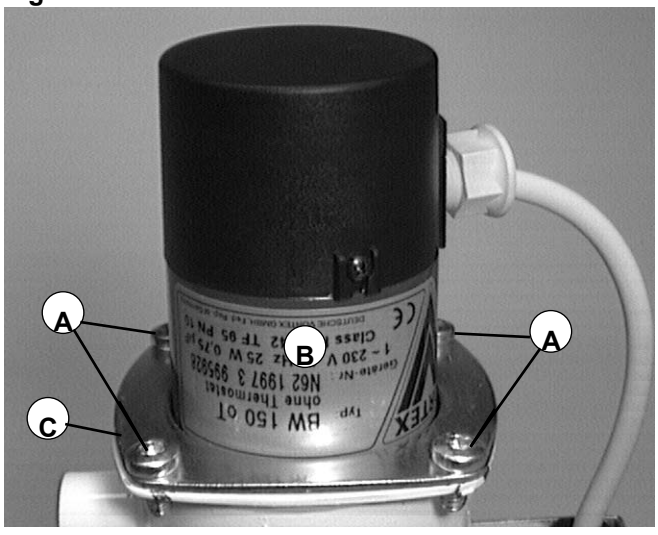
7. Fit a new o-ring in the groove, and insert the impeller in the centre of the pump housing.

8. Fit the pump motor and fasten it through the retaining plate. Tighten the screws alternately.

9. Refill the heating system with liquid (see the caravan or boiler instruction book for the location of the filling point). Close the main circuit breaker or insert the pin plug and test run. Bleed the heating system before operation.

NOTE! Never run the pump motor without liquid. If the electrical heater is fitted to the rear on an Alde Comfort Boiler, the pump motor must not be started until all the air has been bled. Run using the 12-volt pump until the air is gone.

Fig 12



5:5 Replacing the impeller

1. Drain the liquid from the heating system (see the caravan or boiler instruction book for the location of the drain cock). Open the main circuit breaker or remove the pin plug for the electrical heater from its wall socket, ensuring the power is disconnected.

2. Unscrew the four screws (fig 12 A) in the retaining plate. Pull out the pump motor (fig 12 B) from the electrical heater, and take out the impeller (fig 14 A) and the o-ring (fig 14 B).

3. Fit a new o-ring in the groove, and insert the new impeller in the centre of the pump housing.

4. Fit the pump motor and fasten it through the retaining plate. Tighten the screws alternately.

5. Refill the heating system with liquid (see the caravan or boiler instruction book for the location of the filling point). Close the main circuit breaker or insert the pin plug and test run. Bleed the heating system before operation.

NOTE! Never run the pump motor without liquid. If the electrical heater is fitted to the rear on an Alde Comfort Boiler, the pump motor must not be started until all the air has been bled. Run using the 12-volt pump until the air is gone.

Fig 13

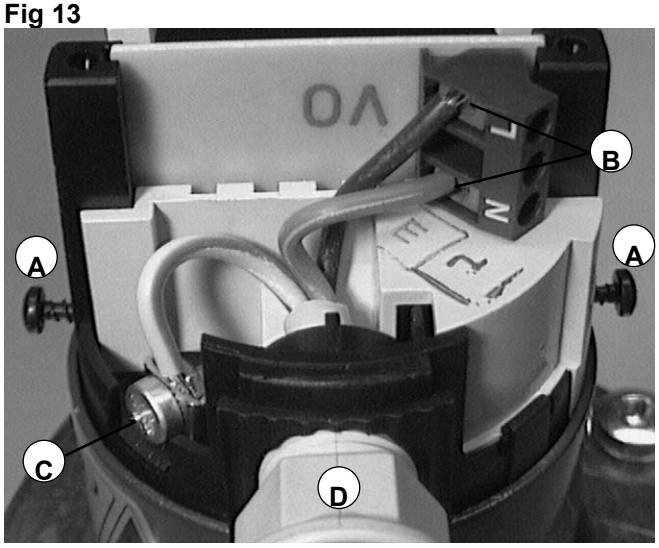
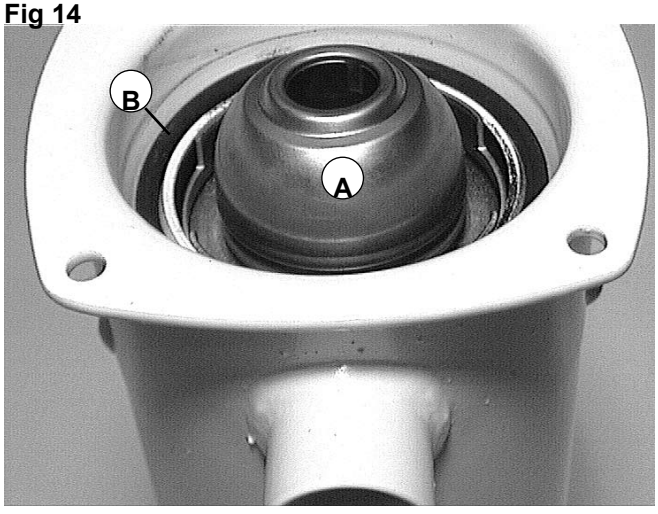


Fig 14



5:6 Fitting the pump ring

NOTE! Is fitted as standard on all models since production year 91/92. The pump ring is fitted to stabilise the impeller.

1. Drain the liquid from the heating system (see the caravan or boiler instruction book for the location of the drain cock). Open the main circuit breaker or remove the pin plug for the electrical heater from its wall socket.

2. Unscrew the four screws (fig 12 A) in the retaining plate. Pull out the pump motor (fig 12 B) from the electrical heater, and take out the impeller (fig 14 A) and the o-ring (fig 14 B).

3. There are two types of pump housing in the electrical heater depending on the year of manufacture. On older models, pre-1989, the washer in the pump housing is bent to 45° (see fig 15), while on later models, it is bent at 90° (see fig 16). On older models a pump ring with a height of 19 mm must be used, while the later models take a 9-mm high pump ring. Place the pump ring with the openings up towards the pump motor, and at an angle of 90° to the outlet pipe. To prevent the ring turning or rattling, it should be squeezed until it is slightly oval.

4. Fit a new o-ring in the groove, and insert the impeller in the centre of the pump housing.

5. Fit the pump motor and fasten it through the retaining plate. Tighten the screws alternately.

6. Refill the heating system with liquid (see the caravan or boiler instruction book for the location of the filling point). Close the main circuit breaker or insert the pin plug and test run. Bleed the heating system before operation.

NOTE! Never run the pump motor without liquid. If the electrical heater is fitted to the rear on an Alde Comfort Boiler, the pump motor must not be started until all the air has been bled. Run using the 12-volt pump until the air is gone.

Fig 15

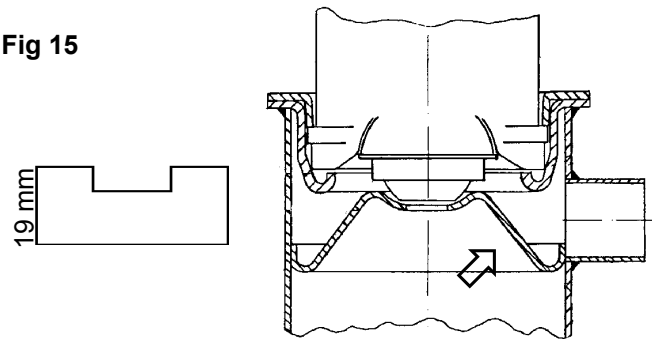
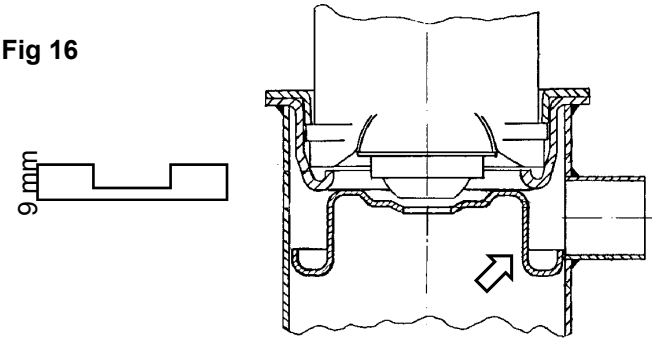


Fig 16



5:7 Replacing the electrical heater tube

1. Pull the pin plug for the electrical heater out of the wall socket or, if the electrical heater is permanently connected, cut off the electrical supply and unscrew the cables.

2. Drain the liquid from the heating system (see the caravan or boiler instruction book for the location of the drain cock).

3. Detach the electrical heater, and remove all components as shown in sections 5:1–5:4. With the type 2763 electrical heater, remove the circuit breaker with its holder (fig 17 A) and the connection block instead of the circuit board.

4. Detach the cable de-tensioner in the connection box to the pump motor by compressing it using multi-purpose pliers and then pull it straight out (see fig 18).

5. Then remove the cable de-tensioner on the connection cable by inserting a screwdriver between the de-tensioner and the connection box, and levering outwards until the cable de-tensioner comes free (see fig 19 A).

6. Remove the earth plate and the cables (fig 19 B). On older models the earth connections are attached to the electrical heater tube with screws and washers.

7. Lift the pump ring out of the pump housing and move it over to the new electrical heater tube, see section 5:6.

8. Then install all components in the new electrical heater tube in accordance with sections 5:1–5:4. **NOTE!** *Remove any residual paint on the earth connections and from the holes for the screws which attach the cap (fig 19 C)*.

9. Fit the cable de-tensioners on each side by pressing them into the holes with multi-purpose pliers.

10. Attach the contact plate to the electrical heater tube, and fit the earth cables.

11. Re-attach the electrical heater and refill the heating system with liquid. Insert the pin plug in the socket or fasten the cables in the junction box and test run the electrical heater. Bleed the heating system before operation.

NOTE! Never run the pump motor without liquid. If the electrical heater is fitted to the rear on an Alde Comfort Boiler, the pump motor must not be started until all the air has been bled. Run using the 12-volt pump until the air is gone.

Fig 17

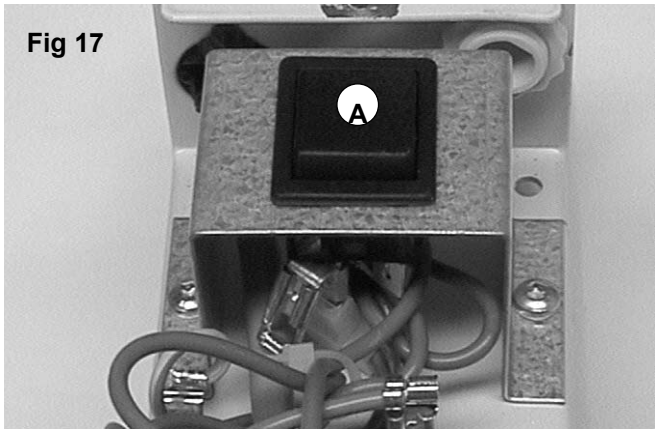


Fig 18

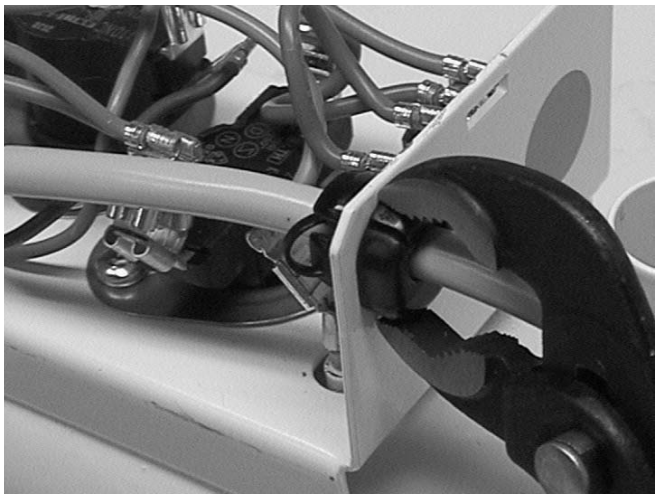
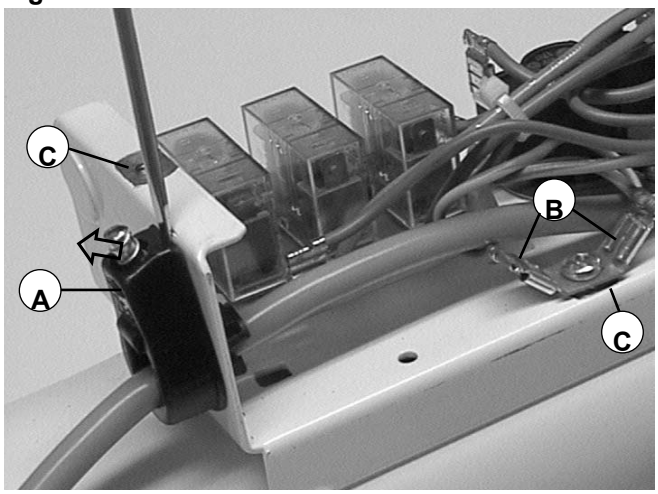
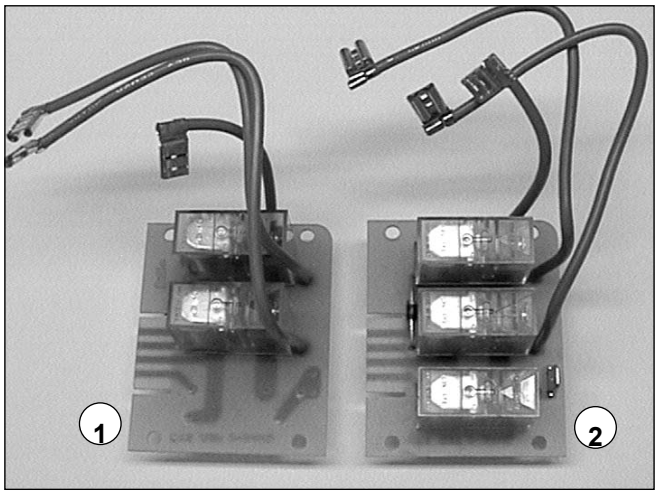


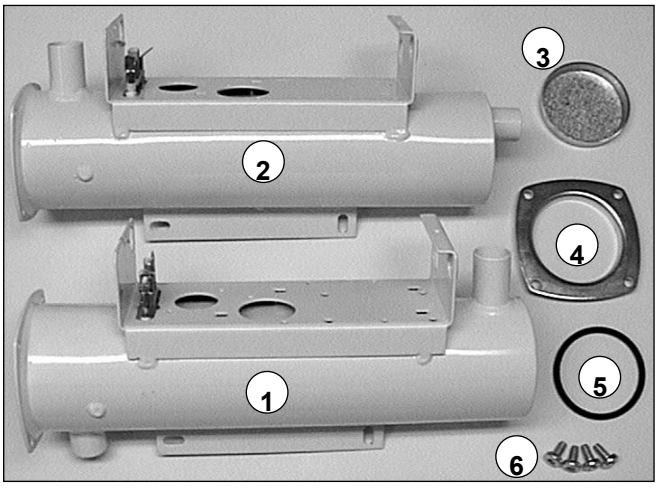
Fig 19



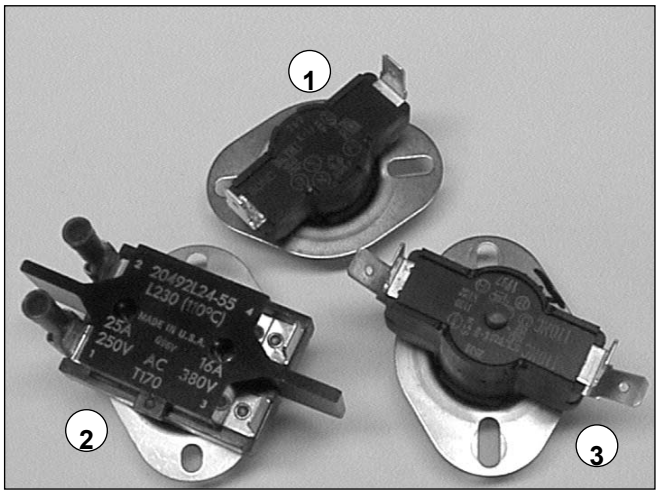
6:0 Spare parts for electrical heaters 2737, 2762 and 2763



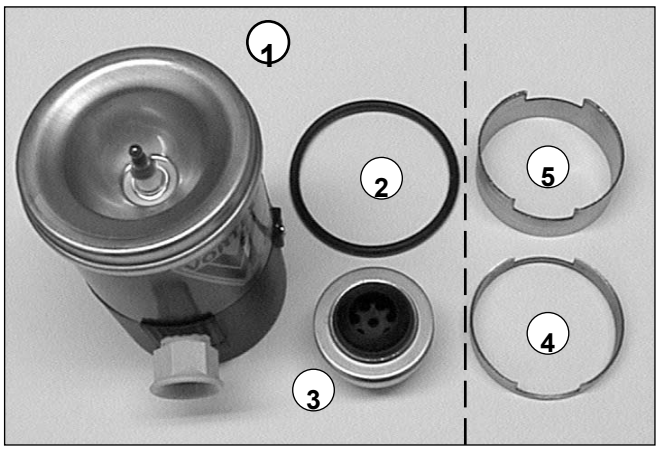
1. **2737 140** Circuit board (2 relay) for 2737
2. **2762 160** Circuit board (3 relay) for 2762



1. **2762 236** Electrical heater tube (2737 921, 2762 921)
2. **2762 276** Electrical heater tube (2762 923, 2763 901)
3. **2762 158** Cap
4. **2762 122** Retaining plate
5. **2761 212** O-ring
6. **5810 046** Screw



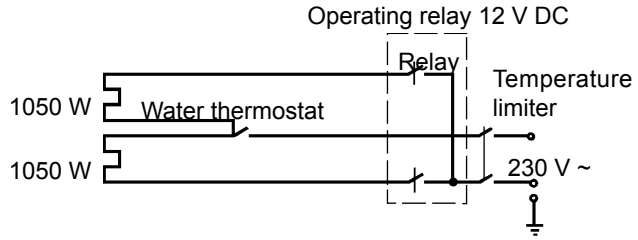
1. **2737 176** Operating thermostat
2. **2737 185** Overheating protection (resetting button on side)
3. **2737 186** Overheating protection (resetting button on top)



1. **2762 260** Circulation pump including o-ring, impeller
2. **2761 212** O-ring
3. **2762 258** Impeller
4. **2762 221** Pump ring 9 mm
5. **2762 222** Pump ring 19 mm

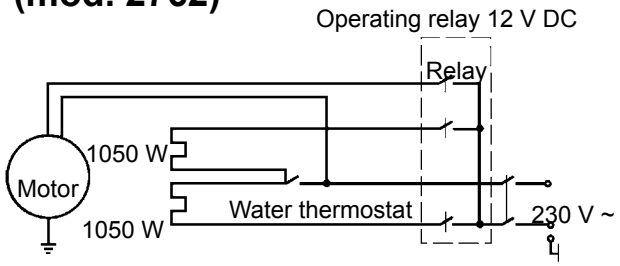
7:0 Circuit diagram 230 V ~

(mod. 2737)



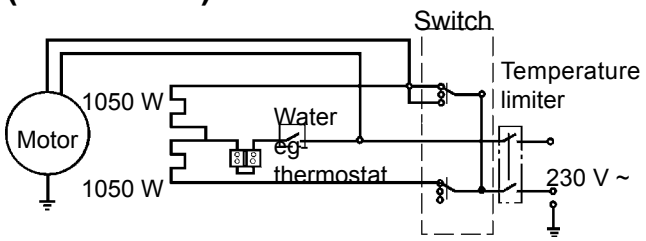
7:1 Circuit diagram 230 V ~

(mod. 2762)



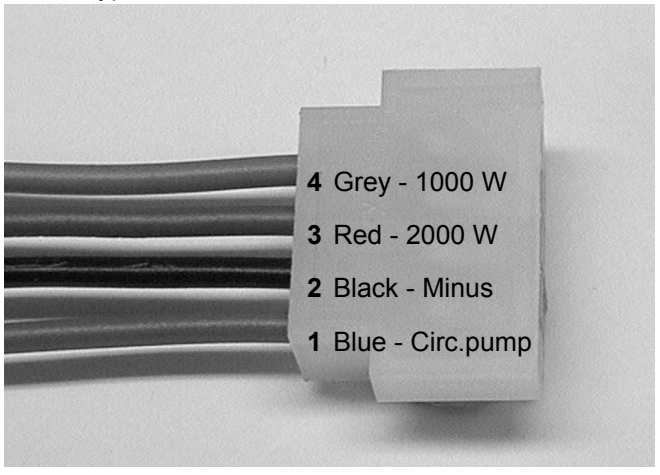
7:2 Circuit diagram 230 V ~

(mod. 2763)

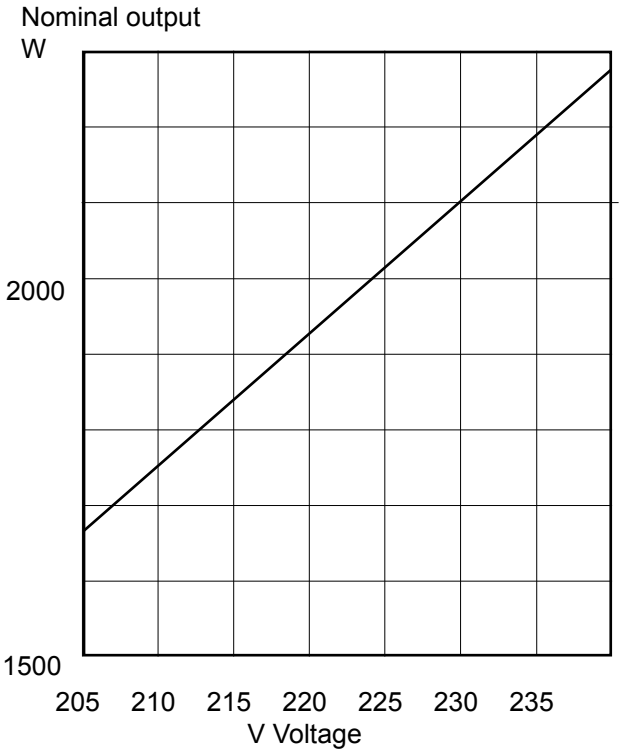


8:0 Terminal block cables

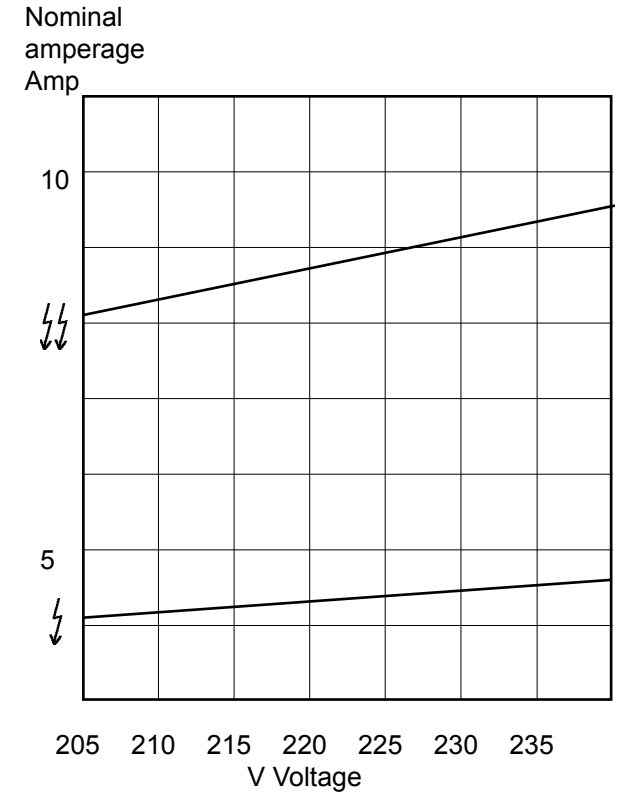
Not on type 2763 electrical heater



9:0 Output diagram



+ 25 W for electrical heaters 2762 and 2763



+ 0.1 amp for electrical heaters 2762 and 2763

98.05.26. GB.

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